

## Industrial Enlargement and Competitiveness Index

*Art Kovačič* \*

**Abstract:** Over the last decade Slovenia has achieved clear and positive macro-economic results that have placed it among the most successful transitions countries. The basic indicators show that it has been integrating and catching up with European Union member states at an ever increasing pace. Despite this, the challenges of a global economy-where only innovation and entrepreneurship can compete successfully, and the relative lag in the competitive capacity of our economy behind numerous other countries in the world rankings, require drastic changes to be made to Slovenia's economic structure to adopt as much as possible to the demands of the knowledge based economy.

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**JEL classification:** O11, O24, O38, O57

### Introduction

The current wave of EU integration process has generated widespread interest among new member countries in the development and upgrading of national competitiveness. Further, the role and significance of local economies has increased both in developed economies and elsewhere. This development has been affected by international processes of co-operation which strengthened the identity of local economies as independent and self-responsible economic units. On the other hand, internal structural problems have forced local economies to seek new strategies and operations. Indeed, local economies become more important with globalization for a number of reasons. Argument that globalization is accompanied by regionalization is based on reduced transaction costs, which in the era of flexible production rises due to clustering and re-agglomeration activities including linkages between innovative actors. Despite of national consensus on the importance of Slovenia becoming a member of EU, it is crucial to build along its distinct model of wealth creation which

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incorporates strategies of regional development. Recently, Porter (1998) introduced a competitiveness theory which builds upon empirical framework. Based on ten in-depth studies of developed economies, he proposed a diamond shaped framework, which includes four sets of attributes: factor (input) conditions; the context for firm strategy and rivalry; demand conditions and related and supporting industries. He also identifies two residual influences: government and chance events namely. The underlying thesis of his framework is that to understand why nations gain competitive advantage the focus should be on particular competitive industries within the nation. However, for national competitive advantage to occur it is not sufficient to have unconnected competitive industries; it is necessary to develop clusters of home based industries which are competitive and linked together through a range of common, supporting conditions. It follows that the sustainability of competitive advantages lies in the national potential to initiate cluster formation processes. The conditions which bring about industry clustering grow directly out of determinants of competitive advantage and are a manifestation of their systematic character. Porter also argues that a set of strong related and supporting industries is important to the competitiveness of firms. This usually occurs at regional as opposed to a national level. OECD summarized the operational and strategic sources of competitive success at the firm level: The competitiveness of firms today is largely shaped by the various aspects of corporate organization that command the effectiveness of industrial R&D and other innovation-related investments. At firm level, factors contributing to competitiveness thus include: the successful management of production flows and raw material and component stocks; the successful organization of effective interactive integrating mechanisms between market planning, formal R&D, design, engineering and industrial manufacture; the capacity to blend in-house R&D and innovation-related activities with R&D cooperation with universities and other firms; the capacity to incorporate closer definitions of demand characteristics and the evolution of markets into design and production strategies; the capacity to organize successful interfirm relationships with component and material supplier firm upstream and with retailers downstream; and finally the steps taken by firms to enhance workers' and employees' skills through investments in vocational training as well as to establish greater degrees of worker responsibility in production. The concept of competitiveness has in the last decades extended from the micro-level of firms to the macro-level of countries. Between the two levels stands the concept of regional competitiveness which is the focus of the "EU Regional Competitiveness Index", RCI hereafter, a joint project between DG Joint Research Centre and DG Regional Policy. The final goal is measuring the competitiveness of European regions at the NUTS2 level by developing a composite index. But, why measuring regional competitiveness is so important? Because "*if you can not measure it, you can not improve it*". A quantitative score of competitiveness will facilitate Member States in identifying possible regional weaknesses together with factors mainly driving these weaknesses. This

in turn will assist regions in the catching up process. The study starts from the review of the latest literature contributions to the concept of 'regional competitiveness' and of some well-known existing competitiveness indices at country and regional level (NUTS1 and NUTS2). At the country level, the Global Competitiveness Index by the World Economic Forum, and the World Competitiveness Yearbook by the Institute for Management Development (IMD) are presented. At the regional NUTS1 level, the European Competitiveness Index by the University of Wales Institute is discussed. A simpler but more detailed geographical description of competitiveness is offered by the 'Atlas of Regional Competitiveness' (Eurochambers), reflecting the international recognition of the importance of analysis at the regional NUTS2 level. Specific examples of competitiveness measures at the regional level in some European countries are also discussed. The WEF Global Competitiveness Index – GCI – has been the main reference framework for the construction of the RCI. This choice has been driven by the fact that GCI is the most internationally recognized and acclaimed index in the field of competitiveness and its framework covers a very comprehensive set of aspects relevant to competitiveness. There are, however, some key differences that distinguish the RCI from GCI due to the RCI European and regional dimensions. Eleven pillars are included in the RCI with the objective of describing different dimensions of the level of competitiveness. The pillars are designed to capture short- as well as longterm capabilities of the region. They are classified into three major groups: the pillars Institutions, Macro-economic stability, Infrastructure, Health and Quality of Primary & Secondary Education are included in the first group and represent the key basic drivers of all types of economies. As the regional economy develops, other factors enter into play for its advancement in competitiveness and are grouped in the second group of pillars – Higher Education/ Training and Lifelong Learning, Labor Market Efficiency and Market Size. At the most advanced stage of development of a regional economy, key drivers for regional improvement are factors related to Technological Readiness, Business Sophistication and Innovation, included in the third group. The set of indicators which populate each pillar is carefully chosen according to the literature review, experts' opinion and data availability.

The major data source is Eurostat with some additional official sources - OECD-PISA, OECD Regional Patent database, European Cluster Observatory, World Bank Governance Indicators and Ease of Doing Business Index - where appropriate data was not directly available from Eurostat. Most recent data have been used for all indicators, with a temporal range for most indicators between 2007 and 2009. A detailed statistical analysis is carried out separately for each pillar with the aim of assessing the consistency of the proposed framework both at the level of indicators and of pillars. The analysis is twofold: a univariate analysis indicator by indicator and a multivariate analysis on each pillar as a whole. The former allows for detecting possible problems with: i) missing data; ii) distribution asymmetry and outliers and iii) different measurement scales. These problems are addressed by adopting: i) specific

imputation methods; ii) power-type transformations to correct for skewness; iii) standardization. The multivariate analysis is carried out at the pillar level on the set of indicators as a whole. The aim is to assess their contribution in describing the latent dimension behind each pillar. 'Anomalous' indicators are in some cases detected and excluded from further analysis. The final RCI is composed of a total number of 69 indicators, chosen by a starting set of 81 candidate indicators. The statistical analysis showed as most consistent pillars Institutions, Quality of Primary and Secondary Education, Labor Market Efficiency, Market Size and Innovation. The key driver for the computation of the RCI has been to keep it simple, to be easily understood by non-statisticians, and at the same time robust and consistent. For each pillar, RCI sub-scores are computed as a simple average of the transformed/normalized indicators. Scores at the pillar group level (sub-indexes) are computed as an average of the corresponding sub-scores. The overall RCI score is the result of a weighted aggregation of the three sub-indexes. For the final aggregation we follow the approach that the World Economic Forum adopts for the GCI with the aim of taking into account the level of heterogeneity of European regions, especially after the 2004 and 2007 enlargements. The set of weights adopted for aggregating the sub-indexes depend on the level of development of the regions, classified into medium, intermediate and high stage on the basis of their GDP value. Regions in the medium stage are assigned more weight to the basic and efficiency pillars in comparison to the innovation pillars. The level of competitiveness of more developed economies, on the other hand, takes into account to a larger extent their innovation capability as a key driver for their advancement. The weighting scheme of pillar groups has the effect of not penalizing regions on factors where they lay too far behind. The RCI message is then more constructive: the index provides a measure of competitiveness which allows for fair comparison of European regions and highlights realistic areas of improvement. The final RCI shows a heterogeneous situation across EU regions with Eastern and Southern European regions showing lower performance while more competitive regions are observed in Northern Europe and parts of Continental Europe. As for almost every composite indicator, the procedure followed for the setting up of the RCI is affected by a certain degree of subjectivity. A full robustness analysis is then performed to check the sensitivity of the index with respect to these choices. The variation in score and ranks of the regional RCI is assessed on the basis of the following scenarios: Different sets of weights chosen by random selection within a selected range of variation plus different GDP levels for the classification of the region's development stage; Different composition of the index by discarding one dimension (pillar) at a time to verify whether the pillar contribution to the RCI framework is well balanced; Different types of aggregation based on fully or non-compensatory operators (Ordered Weighted Operators). A Monte-Carlo type analysis is carried out for a total number of 1200 different simulations. Overall, the distribution of the shift in rank for all the simulations and all the regions clearly shows a pick around zero. A

closer look at the distribution highlights that in more than 80% of the cases the shift in rank is at most of 5 positions. The RCI index proves to be rather robust with only a very small fraction of regions with ‘volatile’ rankings. The analysis of the impact of each pillar on the final score shows that the most influential pillars are Higher Education/Training and Lifelong Learning, Labor Market Efficiency and Market Size. This is in line with the fact that these three pillars are assigned, on average across the three development stages, the highest weights. RCI represents the first measure of the level of competitiveness at the regional level covering all EU countries. It takes into account both social and economic aspects, including the factors which describe the short and long term potential of the economy. A statistical analysis has been used to support and, in some cases, to correct the ideal framework of the index, which is characterized by a simple and, at the same time, multifaceted structure. A series of tests have been used to ‘stress’ the index, which proved to be rather consistent with respect to a set of key (at least to our judgment) sources of subjectivity and uncertainty. The RCI provides a synthetic picture of the level of competitiveness of Europe at the NUTS2 level representing, at the same time, a well balanced plurality of different fundamental aspects.

The concept of ‘competitiveness’ has been largely discussed over the last decades. A broad notion of competitiveness refers to the inclination and skills to compete, to win and retain position in the market, increasing market share and profitability, thus, being commercially successful. An important aspect is the level at which the concept of competitiveness is defined; in most cases the micro and macroeconomic level are considered, which are strictly interrelated. The former is relatively clearly defined and is based on the capacity of firms to compete, grow and be profitable (European Commission, 2010). The latter is, instead, subject to debate and is generally viewed and measured at the country level. One of the most important definitions of macroeconomic competitiveness is given by the World Economic Forum which states that competitiveness is the “set of institutions, policies and factors that determine the level of productivity of a country” (Schwab and Porter, 2007). The link between the two levels is straightforward: a stable context at the macro level improves the opportunity to produce wealth but does not create wealth by itself. Wealth is created by utilizing at best human, capital and natural resources to produce goods and services, i.e. ‘productivity’. But productivity depends on the microeconomic capability of the economy which ultimately resides in the quality and efficiency of the firms. Despite the strict linkage between micro (firm) and macro (country) competitiveness, much criticism to the notion of national competitiveness has been raised, mainly due to the existence of an analogy between firms and nations. This is in contrast to the fact that: a) an unsuccessful firm will be expunged from the business whilst this cannot be the case for an underperforming nation; b) the competition among firms is a zero-sum game where the success of one firm destroys opportunities of the others whilst the success of one country may be of benefit for the

others. Many authors, with Krugman (1996) and Porter (2003) among others, agree on the definition of competitiveness as productivity, which is measured by the value of goods and services produced by a nation per unit of human, capital and natural resources. They see as the main goal of a nation the production of high and raising standard of living for its citizens which depends essentially on the productivity with which a nation's resources are employed. Between the two levels of competitiveness stands the concept of regional competitiveness which has gained more and more attention in recent years, mostly due to the increased attention given to regions as key in the organization and governance of economic growth and the creation of wealth. An important example is the special issue of *Regional Studies* 38(9), published in 2004, fully devoted to the concept of competitiveness of regions. Regional competitiveness is not only an issue of academic interest but of increasing policy deliberation and action. This is reflected in the interest devoted in the recent years by the European Commission to define and evaluate competitiveness of European regions, an objective closely related to the realization of the Lisbon Strategy on Growth and Jobs. Regional competitiveness cannot be regarded as neither macroeconomic nor microeconomic concept. A region is neither a simple aggregation of firms nor a scaled version of nations and the meso-level it characterizes is to be duly described. Hence, competitiveness is not simply resulting from a stable macroeconomic framework or entrepreneurship on the micro-level. New patterns of competition are recognizable, especially at regional level: for example, geographical concentrations of linked industries, like clusters, are of increasing importance and the availability of knowledge and technology based tools show high variability within countries. An interesting broad definition of regional competitiveness is the one reported by Meyer-Stamer (2008, pg. 7): *"We can define (systemic) competitiveness of a territory as the ability of a locality or region to generate high and rising incomes and improve livelihoods of the people living there."* This definition focuses on the close link between regional competitiveness and regional prosperity, characterizing competitive regions not only by output-related terms such as productivity but also by overall economic performance such as sustained or improved level of comparative prosperity. Huggins (2003) underlines, in fact, that "true local and regional competitiveness occurs only when sustainable growth is achieved at labour rates that enhance overall standards of living." The complexity of competitiveness was interestingly decomposed by Esser et al. (1995) into four analytical levels as shown in Fig. 1.1 where different types of determinants drive competitiveness. Apart from the meta level, which regards basic orientations of a society and other 'slow' variables that are not of primary interest here, the micro- meso- and macrolevels of competitiveness are clearly described. The meso-level is between the macro- and micro-level and aims at designing specific environment for enterprises. At this level it is highly important that physical infrastructure (such as transport, communication and power distribution systems) and sector policies (such as those regarding education and R&D poli-



cies) are oriented towards competitiveness. As stated in the *Sixth Periodic Report on the Region* (DG Regional Policy, 1999), the challenge is to capture into a competitiveness index the notion that every region has common features which affect and drive competitiveness of all the firms located there, even if the variability of competitiveness level of the firms within the region may be very high. These features should describe physical and social infrastructure, the skills of the work force and the efficiency and fairness of the institutions. The final goal of the present contribution is to develop a competitiveness index for EU NUTS 2 regions which captures all these aspects and describes in synergy the complex nature of economic and social development. In the following section a review of recent competitiveness indices both at national and regional level is due. As discussed in the previous section, the complexity in defining competitiveness leads to difficulties in its measurement. Nevertheless, there are examples of well-established studies which apply specific methods for the measurement of the level of competitiveness at national and, more recently, at regional level. In the following section a brief discussion of selected studies on the theme is provided. At the country level, the Global Competitiveness Index, prepared by the World Economic Forum, and the World Competitiveness Yearbook by the Institute for Management Development (IMD, 2008) are by far the most influential and best known indices. With regards to regional competitiveness, the European Competitiveness Index, computed by the University of Wales Institute, for European regions at the NUTS1 level is discussed. A simpler but more detailed geographical description of competitiveness is addressed in the very recent 'Atlas of Regional Competitiveness' presented in 2007 by the Association of European Chambers of Commerce and Industry (EUROCHAMBERS, 2007), which reflects the international recognition of importance of analysis at the regional NUTS 2 level. Finally, specific examples of measurement of regional competitiveness in some European countries are given. One of the most known competitiveness indices is the Global Competitiveness Index (GCI), published yearly by the World Economic Forum – WEF. It covers a large amount of countries, a total of 131 economies in 2007, and is based on over 100 indicators which describe 12 major pillars of competitiveness. The GCI is intended to measure competitiveness at the national level, taking into account both micro- and macroeconomic foundations of competitiveness. The following definition of competitiveness is the starting point of the WEF index: "*Competitiveness (is) the set of institutions, policies and factors that determine the level of productivity of a country. The level of productivity, in turn, sets sustainable level of prosperity that can be earned by an economy*". The notion of competitiveness implicit in the GCI is, therefore, a mixture of static and dynamic factors including the concept of a country's potential: high levels of current productivity lead to high levels of income and high levels of returns to investment which, in turn, are one of the major determinants of growth potential. This is why a more competitive economy is likely to grow faster over the medium-long run. To describe the complex notion of

competitiveness, the World Economic Forum analyses twelve major pillars (dimensions in statistical terminology) briefly described here.

### *1. Institution*

Private individuals, firms and governments interact with each other in an environment created by both private and public institutions. The Institution pillar aims at describing the legal framework, level of bureaucracy, regulation, corruption, fairness in handling public contracts, transparency, political (in)dependence of the judiciary system. The private sector is also represented as private counterpart of the health of an economy.

### *2. Infrastructure*

High quality infrastructure is obviously critical for efficient functioning of the economy. The pillar describes roads, railroads, ports and air transport as well as the quality of power supply and telecommunications.

### *3. Macro-economy*

It describes the macroeconomic stability with variables such as government surplus/deficit and debt, saving rate, inflation and interest rate spread.

### *4. Health and primary education*

Health of workforce and basic education received by the population are clearly key aspects of a productive and efficient economy. This pillar aims to measure the incidence of major invalidating illnesses, infant mortality, life expectancy and the quality of primary education.

### *5. Higher education and training*

If basic education is the starting point of a ductile and efficient workforce, higher education and continuous training are crucial for economies not restricted to basic process and products. This pillar describes secondary and tertiary education together with the extent of staff training.

### *6. Goods market efficiency*

The ideal environment for the exchange of goods is the one which features the minimum of impediments to business activity through government intervention. The three main aspects described by the pillar are: distortions, competition and market efficiency.

### *7. Labour market efficiency*

This pillar measures efficiency and flexibility of the labour market, as well as the equity in the business environment between women and men.



### 8. *Financial market sophistication*

A well-functioning financial sector provides the right framework for business growth and private sector investments. It mainly describes the sophistication of financial market, the easiness for accessing loans, the strength of investor protection and other similar variables.

### 9. *Technological readiness*

A regulatory framework which is friendly to Information and Communication Technology (ICT) together with ICT penetration rates are of key importance for the overall competitiveness of a nation. Representative variables describing this dimension are for instance internet and mobile telephone subscribers, personal computers, availability of latest technologies and laws relating to ICT.

### 10. *Market size*

The size of the market determines at which level firms may exploit economies of scale. Firms which operate in large markets have more possibility of exploiting scale economies. Both domestic and foreign markets are taken into account in order to avoid discrimination against geographic areas.

### 11. *Business sophistication*

This pillar concerns the quality of the business networks of the country and the quality of individual firms' operations and strategies. These aspects are measured using variables on the quality and quantity of local suppliers, the marketing extent and the production of sophisticated unique products.

### 12. *Innovation*

The pillar refers to technological innovation which, similar to the technological readiness pillar, is a dynamic factor of competitiveness. This pillar is particularly important for more advanced countries which have already reached a higher stage of development. Such countries cannot improve their productivity by 'simply' adopting existing technologies but must invent innovative products and processes to maintain and improve their productivity level.

The 12 pillars taken into account are described by a variety of observable qualitative and/or quantitative variables (indicators). Each pillar is described from a minimum of 2 variables (Market size) to a maximum of 18 variables (Institutions). See Table A.1 in Appendix A for the complete list. Data sources Indicators used for GCI come from two basic data sources called *survey* data and *hard* data. The survey data are drawn from a survey, specifically designed by the World Economic Forum, called Executive Opinion Survey. The survey is completed yearly by over 11,000 top management business executives and gathers qualitative data in order to capture

information on a wide range of variables for which sources are scarce or inexistent. With this survey the WEF aims at collecting information not covered by quantitative data provided by official public sources. Hard data are composed of (quantitative) indicators, such as GDP, number of personal computers or life expectancy, coming from a variety of sources. Examples of data sources are international organizations, such as the International Monetary Fund, the World Bank, United Nations agencies, the International Telecommunication Union, and, when necessary, other sources at national level. The role of a country's stage of development The first step of the aggregating technique for the development of the GCI consists in the definition of the development stage of a country. In fact, different pillars affect different countries in different ways. Three major stages of development are defined.

### *1. Factor-driven economy*

At the lower stage of development the economy is called *factor-driven* and is mainly driven by unskilled labour and natural resources. The first four pillars (Institutions, Infrastructure, Macroeconomic stability, and Health and Primary Education) are the ones which can affect the productivity level at this stage and are thus, included in the factor group.

### *2. Efficiency-driven economy*

As countries move along the development path, wages tend to increase and countries can be classified as *efficiency-driven*. Aspects related to higher education, well-functioning labour markets, large domestic and foreign markets come into play. Pillars from 5th to 10th are included in the efficiency group (Higher education and Training, Goods market efficiency, Labor market efficiency, Financial market sophistication, Technological readiness, Market Size).

### *3. Innovation-driven economy*

At the highest level of development countries are defined as *innovation-driven*. They are able to sustain higher wages only if their businesses are able to exploit the innovation capability of the workforce, developing new products using sophisticated processes. The last two pillars belong to the innovation group (Business sophistication and Innovation). To take into account the different role various pillars play in the competitiveness definition, GCI developers introduce a weighting scheme for the three sub-indices critical to a particular stage of development.

The stage of development of a country is defined on the basis of two criteria: 1. the level of GDP per capita at market exchange rates; 2. the share of exports of primary goods with respect to total exports of goods and services. The first criterion aims at approximating the wage level of a country, which is not always available worldwide. The second criterion is used to define a threshold: countries which export

more than 70% of primary products are defined to be factor-driven. Table 1 reports the different weights which are assigned to the three pillar groups (factor, efficiency and innovation groups) and consequently to the countries belonging to each of the different stages of development. Reading the table column by column it is evident that in factor-driven economies basic pillars are assigned the highest weight (60%), while weights decrease for intermediate and innovation pillars. In countries with efficiency-driven economy, basic and intermediate pillars weight almost equally (40% and 50 %, respectively) with innovation pillars weighting 10%. Finally, more innovative economies are assigned the lowest weight to basic pillars (20%) and weights of 50% and 30% to intermediate and innovative pillars. The World Competitiveness Yearbook (WCY) is an annual report on the competitiveness of countries, published since 1989 by the Institute for Management Development (IMD), a not-for-profit foundation located in Switzerland (IMD, 2008). It analyses and ranks the ability of countries to create and maintain an environment which sustains the competitiveness of enterprises. The 2008 report covers 55 countries, chosen on the basis of their impact on the global economy and the availability of comparable international statistics. The WCY identifies four main competitiveness pillars (factors): economic performance, government efficiency, business efficiency and infrastructure. Each of these pillars is broken down into five sub-pillars (sub-factors) which describe different facets of competitiveness, for a total of 20 sub-pillars. In the following section each pillar is discussed. Different dimensions described The four competitiveness pillars identified by the WCY are:

1. *Economic performance*
2. *Government efficiency*
3. *Business efficiency*
4. *Infrastructure*

The *Economic Performance* pillar is comprised of 80 variables (criteria) and describes the macroeconomic evaluation of the domestic economy. In particular, it focuses on the following sub-pillars: domestic economy, international trade, international investment, employment, prices. The *Government Efficiency* pillar is comprised of 73 variables and describes the extent to which government policies are conducive to competitiveness. Its sub-pillars are public finance, fiscal policy, institutional framework, business legislation, societal framework. The *Business Efficiency* competitiveness pillar is comprised of 70 variables and describes the extent to which the national environment encourages enterprises to perform in an innovative, profitable and responsible manner. Its sub-pillars are productivity, labor market, finance, management practices, attitudes and values. The *Infrastructure* competitiveness pillar is comprised of 108 variables and describes the extent to which basic, technological, scientific and human resources meet the needs of business. Its sub-pillars are basic infrastructure, technological infrastructure, scientific infrastructure, health and environment and education. The data used for the construction of the WCY is a

combination of quantitative (hard) and qualitative data (survey). Hard data consist of statistical indicators acquired from international, national and regional organizations, private institutions and the WCY network made of 55 partner institutions. Survey data are drawn from the WCY annual Executive Opinion Survey data sent to executives in top and middle management in all of the economies covered by WCY. The survey is compiled by a panel of 4000 executives from a representative cross-section of the business community in each country. The hard data represents 2/3 of the overall weight in the final rankings while survey data are assigned a weight of 1/3. There are a total of 331 variables in the WCY of which 254 are used to calculate the Overall Competitiveness rankings. The Standard Deviation Method (SDM) is used in order to obtain a comparable standard scale for computing the overall, pillar and sub-pillar results. The sub-scores of each sub-pillar are then aggregated in order to obtain the pillar score. Each sub-pillar, independently of the number of variables it contains, is assigned an equal weight of 5% on the overall score. (20 sub-pillars x 5 = 100) The STD values of each of the four pillars are aggregated to determine the overall score as the average of the four pillars' scores. The number is then converted into an index with the leading economy given a value of 100. One of the major differences between the WCY by IMD and the GCI by WEF, described in Section 2.1, is that, first, a higher number of variables are comprised in the WCY and, second, the latter puts more emphasis on survey data while the WCY focuses more on hard statistics. Hard data availability is, in fact, the reason why WCY can cover a lower number of countries (55) with respect to those covered by the GCI (131). On the other hand, survey data are considered by IMD less reliable since they are entirely based on subjective opinion (IMD, 2008). Currently two editions of the Robert Huggins Associates' European Competitiveness Index (ECI) are available, issued in 2004 and 2006. The index' main purpose is to measure, compare and examine the competitiveness of regions and nations. The 2004 edition of the ECI comprised EU-15 member states as well as Norway and Switzerland, and their regions at the NUTS-1 level. The 2006 ECI has been expanded to include EU-25 countries and their respective NUTS-1 regions, in total 116 regions plus Norway and Switzerland. The focus on regions reflects and confirms the growing consensus on the relevance of regions as key territorial units for economic analysis. It is well-established that the geographic concentration of specialized inputs, employees, information and institutions favors firms and industries especially in the most advanced economies. This process feeds off itself: the localized productivity advantages of agglomeration push firms to cluster and reinforce these clusters over time. Thus, as globalization tends to nullify traditional forms of advantages, the business environment where firms are located becomes more and more important. In this sense "*globalization is reinforcing localization*". The ECI takes into account three major pillars: creativity, economic performance and infrastructure/accessibility. Two additional pillars, education and knowledge employment, are separately analyzed at regional level in order

to ascertain their correlation with the ECI. They are in fact considered as respectively cause and effect of competitiveness rather than its direct measure. The underlying assumption is twofold: i) highly educated population is a key ingredient for business performances; ii) regions which are competitive in terms of creativity, economic performance and accessibility also tend to host high value-added and knowledgeintensive employment. Correlating education expenditure/enrolments with ECI gives an insight into which regions are most effective in converting human capital resources into economic outcomes. Correlation of knowledge employment with ECI gives an insight into which areas are effective in turning their potential into actual high level employment. In the next Section the dimensions used in the ECI report are detailed. Five different groups of variables are included in the ECI report, but only the first three are included in the computation of the composite ECI:

1. *Creativity*
2. *Economic Performance*
3. *Infrastructure and Accessibility*
4. *Knowledge Employment*
5. *Education*

The *Creativity* dimension is described by 8 quantitative variables mainly related to R&D employment and expenditure by sector. *Economic performance* is described by GDP, monthly earnings, rates of productivity, unemployment and economic activity. Quantitative data related to motorways, railways and air transportation of both passengers and freight are considered to describe the transport and infrastructure density. Two variables related to ICT usage, Broadband lines and Secure Servers, are only available at national level. These three groups of variables form the core for the composite index computation. The methodological approach is detailed in later on in this section. After the ECI computation, further analysis is provided in the report to get an insight into the level of knowledge economy that can be observed in regions. To this purpose the proportion of knowledge-based employment and the level of education of the population are related to regional ECI. *Knowledge-based employment* is described by employment (per 1000 inhabitants) and number of business units (per 1 million inhabitants) by nine sectors. The correlation between ECI and *Education* is based on aggregate data for the number of students per 1000 employees enrolled in secondary and tertiary education, as well as data for secondary and tertiary education at national level (the authors consider data on education expenditure not reliable at the regional level). The choice of aggregating different types of education is driven by the difficulty in comparing data across specific categories of education since the method for students' classification is not homogeneous across countries. Variables for this pillar are listed. For the computation of the composite index, data is first standardized. Afterwards, a Factor Analysis (FA) is performed on the whole set of variables in order to extract communalities which represent the common part of variation of the dataset. The "image factoring" is employed as extraction method

and the varimax is used to obtain optimally rotated factors. The scores of each region for the common dimensions are interpreted as sub-composite indices. Finally, a single composite is derived from FA sub-indices using Data Envelopment Analysis – DEA. DEA is a linear programming tool which estimates an efficiency frontier used as a benchmark to measure the relative performance of countries. DEA computes a benchmark (the frontier) and measures the distance between units (regions in this case) and the frontier. The benchmark can be obtained as the solution of a maximization problem or by external definition. In a DEA solution each unit (region) is assigned a set of weights which depend on the distance of the unit from the frontier. Note that both weights and the frontier are country specific and in general there would be no unique frontier. By DEA each region receives a score between 0 and 1 for each sub-composite index. For each region, a composite score is then computed as the geometric mean of all the DEA scores for that region. These scores are finally indexed round the European average giving the ECI. To explore the assumption of a positive relation between the competitiveness level of a region and its level of knowledge-intensive employment, a correlation analysis between ECI and employment indicators is performed. The strength of this relation is computed with respect to an index of total knowledge employment<sup>3</sup> and to knowledge employment indices separated by sectors. Of the knowledge employment sectors only ICT services are included in the composite ECI so as only a small endogenous correlation effect is expected. Similarly, the correlation between ECI and education expenditure and enrolments is computed. The ECI versus expenditure analysis is performed at national level whilst ECI versus enrolment analysis is performed at regional level.

## **Entrepreneurial Activities**

On the indicators of individual firm competitiveness, the OECD (2008) stated the following: the factors which contribute to micro-economic competitiveness have long been a special concern of managerial and industrial economics. These disciplines use a wide range of indicators (market shares, profits, dividends, investment, etc. ) to assess the competitiveness of firms. Corporate surveys and industrial case studies carried out over the last 20 years have found that: a) in most industrial branches and sectors competitiveness cannot simply be viewed as centred on prices and the cost of inputs (wages and indirect labour costs), b) a variety of non-price factors lead to differences in the productivity of labour and capital (scale economies, process systems, size of inventories, management, labour relations) c) quality and performance of products. Since an integral feature of a knowledge-based economy is that of change and uncertainty, and the continual upgrading of intellectual capita, it is imperative that any new paradigm of the firm should pay particular attention to some elements. This is now being increasingly accepted by economists and business strategists, and

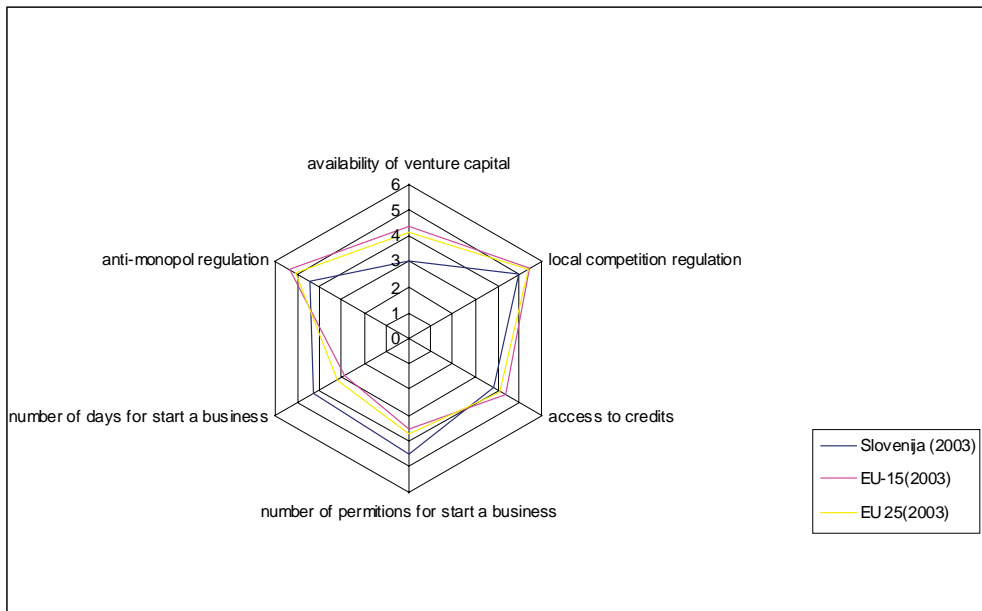


particularly by those who view the firm as a dynamic institution which is continually reconfiguring its resources and capabilities by innovation and learning experiences. Second, since the competitive advantages of firms relate as much to their ability to identify, access and harness assets which are complementary to their core competencies, as to these competencies themselves, and new paradigm of the firm must encompass extra-firm value-added activities within its purview. The new paradigm of the firm must pay particular heed to the spatial configuration of economic activity (and, in particular, to that forged by foreign direct investment and cross-border alliances) as a means of exploiting and enhancing its core competencies. Because of the growing importance of macro (supra-national) and micro (sub-national) regions as economic units, issues such as the economies of regional integration and those of the spatial agglomeration of related activities are now gaining increased attention. The firm-level competitive action is at the core of business strategy and competitive positioning is well accepted. Indeed, the dynamic strategy research stream focuses on the relationship between competitive action and competitive advantage. The more recent hypercompetition concept builds on that dynamic view of strategy to address market environments characterized by extremely vigorous competitive action, in which sustainability of competitive advantage depends on the speed of action and the extent of competitive rivalry. Dynamic firm-level competitive action in competitive environments has three important characteristics. First, competitive advantage is short lived because frequent aggressive firm-level action disrupts causal linkages between competitive conduct and performance outcomes established in the market status quo. Second, firms must undertake series of actions to continuously recreate competitive advantage. Finally, in a competitive marketplace, firms with more competitive activity theoretically will have superior performance over time in relation to rivals with less activity. Firm-level competitive activity is defined as the total number of competitive actions a firm takes in a given year. The level of competitive activity in the industry as the aggregation of firm-level competitive activity minus the competitive activity of the focal firm. When the number of competitive actions between all firms in the industry is high, rivalry will be intense. For example, the role of cooperative mechanisms in fast-paced and complex high-tech industries may be different from that in more stable and simpler low-tech industries. The relationship between firm activity and performance outcomes may also be linked to the number of markets in which firms face each other in competition. For example, software firms may compete in more than one market as the software industry becomes more segmented by customer group and computer platform. Multimarket competition makes the cooperative and competitive interconnections between firms more complex, and competitive activity may be less attractive if rivals have multiple loci for retaliation. In last years we can recognize the growing importance of the enterprise policy in EU. The need for enterprise policy within the European business environment is underlined by the fact that over 99.8 per cent of all enterprises within the



EU are classified as SMEs. Traditionally, policy makers have treated SMEs as young, marginal firms needing protection in the face of open competition. This attitude is changing as many policy makers increasingly recognise that SMEs are among the most dynamic enterprises in EU and are central in sustaining the EU's competitive position. Measures elaborated in the Strategy for Strengthening the Competitiveness of Slovenian Industry and in the Small Business Development Strategy focus on four categories of priorities: (1) modernisation of enterprises, emphasising the need for greater specialisation of enterprises, (2) promotion of research and development and technological upgrading, (3) promotion of investments, (4) promotion of small and medium sized enterprises' development. In the graph can be seen the benchmarking of entrepreneurship conditions among Slovenia, EU-15 and EU-25. So Slovenia lags from the view of entrepreneurship conditions compared to European Union.

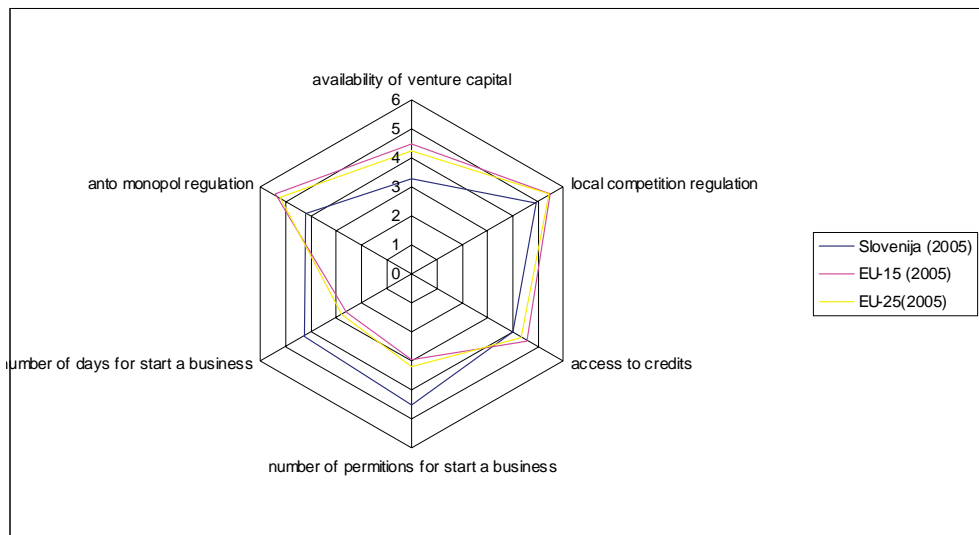
Graph 1: Diamond of entrepreneurship development (2003)



Source, Eurostat, own calculation

On the graph we can see the average position of the economic groups according on WEF,s survey scale (1-7). If many of EU-15 states have well position on the scale then the average will be higher then 3.5. In the year 2003 can be seen a transformation of the banking system in Slovenia. So the better availability of capital can be seen in the entrepreneurship dynamics. European Union as a whole has much better entrepreneurial conditions. It is normal to see that EU-15 ranks higher compared to EU-25. In the future we will see the convergence among both groups.

Graph 2: Diamond of entrepreneurship development (2005)



Source, Eurostat, own calculation

In the year 2005 can be seen that after EU enlargement Slovenia has better entrepreneurship conditions compared to more developed EU countries. The main problem is the availability of the venture capital. The more effective aspects of competitiveness are closely tied with productivity but also with price/quality ratios. The price/quality gap indicator compares the price level of CEECs' exports to the EU with the price level of overall EU imports in the same product category. The price levels are measured as unit values (value per kilo of exports) and the indicators in the standardized form presented here show the percentage deviation of CEECs' export unit values from the average EU import unit values in the perspective product category. In 2000/2001 the price/quality gap indicators were negative for manufacturing exports as a whole and for most individual product groups as well, pointing towards lower than average quality of CEECs' exports to the EU in most fields. The only important exception is Hungary, where positive PQ indicators suggest relatively high quality for manufacturing exports as a whole and for certain industries in particular – textiles (DB), leather & leather products (DC), electrical & optical equipment (DL), transport equipment (DM) and manufacturing n.e.c. (DN). The quality level of CEECs' exports to the EU seems to be especially low in machinery & equipment (DK) and rubber & plastic products (DH). On the other hand, if compared to the level of total manufacturing, the quality level is relatively high in many countries for textiles & textile products (DB) and leather & leather products (DC; with the exception of Romania). Broadly speaking, in the technology-intensive sectors the CEECs seem to concentrate on the low price/quality segment mainly while in the labour-

intensive industries they have specialised in the high quality segment rather. From a dynamic perspective, PQ indicators increased significantly for all CEECs over the period 1995-2001, indicating substantial catching-up in export prices and upgrading the quality of exports to the EU, respectively. The rise of PQ indicators was very pronounced in textiles, leather and leather products, rubber & plastic products, machinery & equipment, electrical & optical equipment and manufacturing n.e.c. Notably, in most countries the increase of PQ indicators was accompanied by rising EU market shares in the respective field, pointing to improved quality rather than rising relative prices impairing (cost) competitiveness.

### **Industrial Enlargement**

After European integration process can be seen the competitiveness level of CEE countries are still very similar. European internal market and the European policies have forced the competitiveness determinant in CEE countries. Slovenia, Slovakia, Czech R. and Hungary are located in Central Europe. These countries have the same historical backgrounds in Austro-Hungarian empire. The well developed classical infrastructure and good educational system can be explained through historical reasons. Today we have a well developed competitiveness methodologies for evaluation. It is interesting to discover are the CEE countries still close after EU integration process. In the research the competitiveness will be evaluated for CEE countries. Differences are very clear among CEE countries, raising doubts about the growth potential of the Central Europe, and pointing towards a possible critique of the strategies that have been adopted in the time of accepting Acquis Communautaire and European policies on many fields. A discussion of the implications of modern economic growth theory and comparisons with the growth paths of rapidly advancing market economies suggests some consistent weaknesses, although there are differences of degree between the individual countries. Competitiveness depends on shareholder and customer values, financial strength which determines the ability to act and react within the competitive environment and the potential of people and technology in implementing the necessary strategic changes. While there are many theories about competitiveness and related interdisciplinary fields of strategy, operations, policies, organizations, they are not used widely by practitioners in their decisions for enhancing or sustaining competitiveness. Research efforts have brought many interesting perspectives and frameworks at the country, industry, and firm level. The popularity of the competitiveness benchmarking at the country level such as Global Competitiveness Reports (WEF), World Competitiveness Yearbooks (IMD), and National Competitiveness Reports is an indicator of growing interest in comprehensive frameworks and data for competitiveness-related decision-making. Competitiveness is a broad concept, which can be observed from different perspectives: through products,

companies, branches of the economy, the short-run or the long-run. The most complex of these is the concept of the competitiveness of the national economy. Some authors even negate its importance, particularly in a system of floating exchange rates. For example, Krugman (1994) sees the competitiveness of the national economy as a dangerous obsession, and similarly, Porter claims that national productivity is the only meaningful concept of competitiveness at the state level. States and companies should be viewed equally, as international trade is not a zero sum game and because states cannot be competitive in all branches of economic activity (Porter, 1990). The concept of competitiveness is somewhat elusive particularly at the national level. There is an on-going academic debate over the merits of emphasising price (i.e., exchange rates and wages) and non-price factors (i.e., technology, design, productivity, human capital etc.) in such a definition. Following the OECD define competitiveness as: "the degree to which, under open market conditions, a country can produce goods and services that *meet the test of foreign competition* while simultaneously maintaining and expanding domestic real income (OECD, 1992). The first Competitiveness Advisory Group appointed by the European Commission argued that competitiveness implies elements of productivity, efficiency and profitability and is a powerful means of achieving rising standards of living and increasing social welfare. The critical determinants of competitiveness are productivity improvements, and technological innovation. Similarly, Scott and Lodge argue that since World War II, the shift of industrial activity towards science-based enterprises such as electronics or chemicals means that national competitiveness is increasingly dependent on technology, capital investment, and labour skills. Unlike previous determinants of national competitive advantage, these factors are not naturally dependent on any particular region or nation state. These resources are internationally mobile and can be attracted and shaped by any state which has a suitable enterprise culture, liberal trade and investment laws, a strong scientific and technical infrastructure, and a good educational system (Lawton, 1999). Competitiveness is more and more a matter of strategies and structures, and less and less a product of natural endowments. Competitiveness development is based on an understanding of the nature of technological change in the business enterprise sector. As discussed below, it focuses on the issue of learning costs to absorb technological and other manufacturing capabilities in enterprises in industrial latecomers. The pace at which enterprises acquire these capabilities is reflected in shifts in comparative advantage at the country-level. Thus, national competitiveness can be proxied by manufactured export performance relative to competitor economies. A more competitive economy is characterized by *rapid manufactured export growth combined with sustained technological upgrading and diversification*. This is a measurable notion, which emphasizes both growth performance and structural change over time in the manufacturing sectors of individual open economies. Moreover, it emphasizes efficiency considerations and gives rise to policy suggestions. Similarly, competitiveness policy can be viewed as the

sum of policy instruments, which may induce more rapid export growth and technological upgrading in a country's enterprises. The need to improve our competitiveness is not imposed by Government, but by changes in the world economy. Improving competitiveness is not about driving down living standards. It is about creating a high skills, high productivity and therefore high wage economy where enterprise can flourish and where we can find opportunities rather than threats in changes we cannot avoid. Many governments seriously peruse national competitiveness rankings produced by WEF or IMD. The study of competitiveness strategy is now a very important obligation of government. All new member countries have high-level official committees to deal with competitiveness, reaching across ministerial divisions to devise international, national or regional policy. The concept of competitiveness and competitive strategy comes from the business school literature. Companies compete for markets and resources, measure competitiveness by looking at relative market shares, innovation or growth and use competitiveness strategy to improve their market performance. The competitive society, in sociological terms, is the society which can achieve a dynamic balance between wealth creation and social cohesion. The available literature on national competitiveness increasingly views competitiveness strategy in holistic terms, involving the use of several related policies (Fagerberg 1996). This literature typically rejects the view found in popular discourses that a single instrument can achieve a major improvement in national competitiveness. Following this literature, this paper emphasizes a holistic approach to national competitiveness policies, which has two elements: a three-way national partnership (involving complementary actions by government, the private sector and labour organization) for national competitiveness. Slovenia had a better position compared to other CEE countries in the years of the transition process. In Slovenian competitiveness can be seen that political and management efficiency still lag against economic performance and infrastructure development. A globalized economy is a distinct ideal type from that of the inter-national economy and can be developed by contrast with in. In such a global system distinct national economies are subsumed and rearticulated into the system by international processes and transactions. The inter-national economy, on the contrary, is one in which processes that are determined at the level of national economies still dominate and international phenomena are outcomes that emerge from the distinct and differential performance of the national economies. Economic performance of CEE countries can be seen in the graph. In the graph can be seen the ranks of selected countries in World Competitiveness Yearbook. The Czech R. has the best economic performance among CEE countries. Slovenia ranks better than Hungary and Slovak R. The inclusion of economic performance in competitiveness assessment is partly based on the premise that the current level of prosperity of a country reflects its past track record and also the future possibilities. The main measures of economic performance are the level of development, the extent of international trade and investment and movements in employment and prices. Glo-

balisation proces support international integration and coordination of independent activities with the combination of governmental and entrepreneurial strategies that are the best in the world arena (governmental strategies as clusters, support of entrepreneurial activity). From the graph can be seen that Slovak R really improved the governmental efficiency in the last years. Estonia as a benchmark country has a still higher governmental efficiency than CEE countries. The government efficiency criteria reflect the principle that government should provide an enabling environment for a stable and predictable macroeconomic and social conditions and thus minimize risks for enterprises. The important role is to provide adequate and accessible educational and knowledge resources. From the view of business efficiency the Czech R ranks on the first place among the CEE countries. Estonia has still the higher business efficiency than CEE countries. The business efficiency criterion focuses on the entrepreneurship skills available in the country, the efficiency and effectiveness of the financial sector and the adaptation of people on modern business needs. The CEE countries had a better position in infrastructure development in year 2002 than in the last years. Some methodological changes occur. The CEE countries rank well especially in classical infrastructure. The modern way of measuring infrastructure is oriented on business needs. In CEE countries can be seen a high density of roads and railroads. On the other side the managers in the companies are not satisfied with the infrastructure net.

### **Industrial Development in CEE Economies**

Industrial competitiveness is less important after increasing importance of the service economy. The car industry still has a multifactor effect on other activities. Industrial competitiveness can be shown for one or for more industries. In new member countries the structure of the industry has changed. In the article I will test three hypotheses. First hypothesis is that FDIs have forced the specialization process in CEE countries. The second hypothesis is that car industry has a special importance for industrial competitiveness. The third hypothesis is that industrial competitiveness is still important for economic integration of CEE countries. Some member countries have increased the specialization of industrial sector, while the share of labour intensive industries has decreased. The inflow of foreign direct investment has increased the industrial specialization, because it is rare that inflow of FDI goes in all industries. For industrial sector as a whole, and from a strictly business point of view, complying with the EU legislation system requires considerable additional investments, increases in direct and indirect charges for public services. For more sectors is the additional cost by accepting the Union's environmental regulations, both through the upgrading of production facilities and through increased charges for waste management. Other kinds of horizontal legislation that are likely to affect future investment

requirements of individual firms are occupational health and safety requirements, and employment legislation. In addition, industry will be affected by single market standards covering individual specifications. The view on industrial competitiveness is different compared with overall competitiveness. Slovakia had achieved the important locational attractiveness among new member countries, while it hosts three car producers. PSA Peugeot-Citroen, VW and Kia have increased the industrial competitiveness of Slovakia. From the Slovakian case can be seen that car industry can add a lot to competitiveness of the whole economy. In the year 2007 will Slovakia make around 600.000 cars. The reasons for such a success can be seen in next elements. Slovakia had a well developed a strategy of industrial development, while the locational attractiveness for car industry had an important weight. Slovakia has a relative cheap labour force and favourable location. Bratislava is close to Vienna, so the strong investments in infrastructure are not so important as in other CEE countries. Car producers are located close to Austrian border. The higher global integration of international trade and investments increased the challenge for industrial location. The challenge among CEE countries is high, while the state mechanisms occur the regulation for industrial performance (Peneder, 2001). Better entrepreneurship conditions, development of human capital and circumstances for achieving an industrial location are become better. The industrial competitiveness in new member countries is in interaction with car industry. From trade balance with EU-15 can be seen that Slovakia and Hungary have increased the position in last years. Local decision of enterprises are in interaction with motives of business environment and economy of scale, that support the locational specialization. Why countries don't specialize just in some industries. By increasing productivity in main industries we need a higher share of technological research and investments, that finance such a development. By taking part in technological challenge is for the state well that are not taking the same development steps as competitors. Existed technology and knowledge on selected location support the possibilities for specialization process. States usually specialize in the industries that have competitive advantages to other states. Specialization process is really important from the view of european competitiveness. Integration process gives a chance to companies to achieve an optimal position and location. Economy of size and better movement of labour force are the main motives of european competitiveness on the european single market. Stronger integration on the basis of production specialization of CEE countries is common. International trade and higher investments support the national productivity. So the industry can specialize on that fields, where domestic companies are more productive compared to foreign companies. No state can achieve a high competitiveness in all industries, while the competitive advantages can be seen just in some industries. States with higher standard usually specialize in capital, technological and knowledge intensive industries. Rich countries have an advantage by such a specialization, while the domestic demand is more sophisticated (new products, high quality, willingness for



diferenciation). On the other side is domestic economy more developed (innovation revenues, higher capacities for development). Over the last decade, Slovenia has achieved clear and positive macro-economic results that have placed the country among the most successful transitional countries. The basic indicators reveal it has been integrating and catching up with the European Union member countries at an ever increasing pace. Despite this, the challenges of a global economy, where only innovation and entrepreneurship can compete successfully, and the relative lag in the competitive capacity of our economy behind numerous other countries in the world rankings, require drastic changes to be made to Slovenia's economical structure to adopt as much as possible to the demands of the knowledge-based economy. That means the transformation from an economy with low-added value whose competitiveness is based on low-operative costs into an economy based on production and service activities whose competitive advantages are high-added value, quality, innovation, and entrepreneurship. The Ireland has a more than 40 percent high-tech in manufactured export. The world competition has become especially fierce in high-tech sectors like microelectronics, biotechnology, new materials, telecommunications, robotics, computers and aerospace. Hungary ranks highest in terms of high-tech. The reason for such a high ranking is the presence of a large amount of foreign capital and multinational companies. Slovenia's weakness from the view of competitiveness is high-tech position. No advanced economy can maintain high wages and living standards, and hold its own in global markets, by producing standard products using standard methods. In addition to human resources, a strong national innovation infrastructure includes the ability of funding for innovation-related investments. There are some reasons why small countries as Slovenia do not display the same thrust towards high-tech industries as do larger countries. High-tech industries are closely associated with high risk. Losers as well as winners are to be expected, as the selection of superior products is essentially based on trial and error (Carter 1994). The differences are presumably not due to disparities in the supply of entrepreneurial talent, but are certainly affected by the obstacles experienced in small countries in obtaining a sufficient market for a specialised and proficient venture capital sector (DeBresson, Lampel 1985). The lack of venture capital will constrain the economic ability of entrepreneurial efforts in small countries.

Sustaining competitiveness in high-tech industries is not only linked to high risks, but also to high costs. The most successful high-tech corporations of today need continental, or even world-wide, markets to be able to write off in a sufficiently short time ever increasing investment costs caused by ever increasing costs of R&D. Leading-edge technologies require large investments for a considerable time, but may nevertheless result in an only modest turnover, at least in the short run. The limited size of the relevant labour market will influence the range of industries in which small countries might successfully specialise. While the process of internationalisation has open the borders for commodities, and has later encompassed services, cap-

ital and some types of knowledge, no common international labour market has been established. Even if a high-tech firm in a small European country was, on the basis of a sufficiently promising idea, able to raise the necessary capital from the international market via the stock exchange of Tokyo, Frankfurt, London or New York, its full potential could not be realised because labour market rigidities would, early in the process, inhibit the persistent corporate growth which is vital in order to prevent followers from catching up. The volatile nature of high-tech industries simply does not fit the rigid labour market structures and its growth potential cannot unfold given the limited size of the appropriate labour force in small industrial countries (Maskell et al, 1998). Entrepreneurship and the diffusion of innovation, which considerably increase the speed at which new high-quality and low-cost products replace existing products, are two driving forces of the knowledge-based economy, and they are changing the economic structure of the leading countries. These are also the two key factors in competitive advantage on a world scale. Slovenia lags behind the economically most successful countries in precisely these areas. Slovenia must therefore become more innovative and more entrepreneurial. Without competitiveness, there will be no stable economic growth, no high quality of living, and no social cohesion. Although competitiveness, innovation and entrepreneurship fall within the domain of the private sector, it is also undoubtedly true that business success is dependent on state policy, which sets the conditions for commerce. The new concept of qualitative economic development requires the directing of state policy away from traditional interventionist measures and towards the promotion of the development of knowledge, innovation, information, and new technologies. Despite of national consensus on the importance of Slovenia becoming a member of the EU, it is crucial to build along its distinct model of wealth creation, which incorporates strategies of regional development Porter (1990) introduced a competitiveness theory, which builds upon empirical framework. Based on ten in-depth studies of developed economies, he proposed a diamond-shaped framework, which includes four sets of attributes: factor (input) conditions; the context for firm strategy and rivalry; demand conditions and related and supporting industries. He also identifies two residual influences: namely government and chance events. The underlying thesis of his framework is that to understand why nations gain competitive advantage, the focus should be on particular competitive industries within the nation. However, for national competitive advantage to occur, it is not sufficient to have unconnected competitive industries; it is necessary to develop clusters of home-based industries which are competitive and linked together through a range of common, supporting conditions. It follows that the sustainability of competitive advantages lies in the national potential to initiate cluster formation processes. The conditions that bring about industry clustering grow directly out of determinants of competitive advantage and are a manifestation of their systematic character. Porter also argues that a set of strong related and supporting industries is important to the competitiveness of firms. This usually oc-

curs on a regional as opposed to a national level. Shares of the industries in manufacturing are calculated from the view of employment (2-digit NACE). Specialization of Slovenian manufacturing is becoming stronger. In the first year the index was only 0,0892. In 2000 the index was 0,0925 and 0,0944 in the next year. In the first year was the highest proportion of employment in textile industry DB (14%) in basic metals and fabricated metal production DJ (12,4%) and in machinery and equipment production DK (11,9%). In the last year was the highest proportion of employment in basic metals and fabricated metal production DJ (15%) in electrical and optical equipment production DL (12,8%) and in textile production DB (11,6%). In Slovenian case is hard to differ between local, regional and national economy, because country has only two million people. In the literature the clusters are usually connected with regional economy. Clusters and networks provide the context and the spillovers. Free riders do not exist, nor do free lunches, in the sense of complete knowledge transfers. Certain items of knowledge may flow relatively freely, but other types need to be more localised in their transfer, and these spillovers can raise the innovation of localised partner firms. Business enterprises operate within a regional production system which is constituted by principles of production and organization. Regions that enjoy a high per capita income are generally regions with a critical mass of business enterprises with the capacity to add value to the resources they use. The idea of regional specialization implies that firms do not compete alone in the global marketplace but as members of networked groups of firms sharing and building on distinctive regional capabilities. A region's capacity to initiate and sustain high value added production depends upon its capability to foster and reproduce entrepreneurial firms. Specialization process is very important for new EU member states. European internal market will foster specialization process in all EU members in the next years. The competitive position of each EU country depends on specialization of domestic industry. In an open economy, the competitiveness of firms will be enhanced by the feedback loops with the localised capabilities. Firms of a certain kind find some localised capabilities more valuable than others. The originally chosen location of an industry might have been basically accidental. But once in place, the specialised locational demands from the firm will influence the future development of the localised capabilities, making it advantageous for the industry to remain in the area, and for outlying firms to relocate. Some firms deliberately incorporate specific parts of the localised capabilities in constructing a consolidated strategy, by acquiring resources primarily from the local factor market and by subsequently building unique competencies on these resources. This makes good sense. From while the firm specific strategies might be imitated by a clever competitor located elsewhere, it is a lot more difficult for even the best competitors to confront the abstruseness of the combined strategy, and to disentangle the ambiguity created when integrating various elements of the localised capabilities. The presence in the nation of related and supporting industries is one of the major determinants of a nation's

competitiveness. Innovation within the industrial cluster is highly dependent on close and persistent user-producer contracts. The producer gains from “learning-by-doing” while the user gains from “learning-by-using”. Thus, the success of a given innovation is highly determined by the extent of learning-by-interacting between parties connected together by flows of knowledge, skills, and services. Government can play an integral role in facilitating learning-by-interacting processes. Each industrial segment in the industrial cluster represents a source of capital, technology, and market demand for a variety of other industrial segments. In the last years, I have recognized some changes in European industrial policy in this way. Some characteristics of Slovenian competitiveness can be recognized from the export structure. Exports by Slovenian enterprises are thus still concentrated on non-differentiated products and services with lower value added but with an adequate level of quality. The share of exports based on natural resources is too high, and the smokestack industries contribute one fifth of value added in manufacturing. Besides the corporate governance problem, the main barrier to efficiency and improved competitiveness of enterprises is the lack of managerial skills that has a negative impact on the investment capacities of enterprises as well. In the future, the competitiveness of Slovenian enterprises will be increasingly based on knowledge and adaptability of enterprises and the economy as a whole. Despite structural changes, the Slovenian economy remains disproportionately dependent on traditional industries like textiles, clothing, metals, and transport equipment. The relatively low share of labour and capital deployed in industries considered to be the 21<sup>st</sup> century vehicle of economic growth – computer and office equipment, communication equipment, semiconductors, and biotechnology – hinders long-term development, and weakens the long-term competitive prospects for the economy. Simultaneously, new private enterprises are not growing, and the share of small enterprises in the new technology industries remains insignificant. Thus, Slovenia’s industrial productivity lags far behind most advanced economies, and, despite comparatively low wages, the export competitiveness of its manufacturers remains low. In 1998, gross value-added per Slovenian employee remained nearly three times lower than in comparable industries in the EU countries (Petrin et al, 2002). Specialization factor can be calculated in the way that we put together three or five the strongest industries. In the picture can be seen the sum of five strongest industries of manufacturing from the view of production in the years 1993, 1998, 2002 and 2005. The share of five strongest industries in Slovenia has never achieved a share of 60 per cent in years 1993 and 1998. In the years 2002 and 2005 has the specialization of Slovenian industry achieved a higher value (closer to Slovakia and Czech R.) Specialization of production is very high in Hungary. Specialization of Hungarian industry is higher compared to other countries. Share of five strongest industries have achieved a 75% share in the last period. Specialization process can be measured also by overall structure of manufacturing. That can be done with Herindahl index.

$$HI = \sum_{i=1}^n S_i^2$$

where is:

$S$  = share of industries in manufacturing

$n$  = number of industries

Table 1: Absolute specialization in new member countries

Herfindahl indeks	1993	1998	2002	2005
Hungary	0,131679	0,124759	0,157162	0,209965
Czech	0,109993	0,110084	0,101873	0,107449
Slovakia	0,108632	0,103052	0,110916	0,113589
Slovenia	0,091609	0,093109	0,095783	0,103212

Source own calculation

By herfindahl index has a Hungary the highest position in the whole period 1993-2005. Reasons for high concentration of FDIs in specific sectors had fostered the sectoral movement in transition period. Slovakian industry had in the period 1993-2005 increased the specialization process, while the Czech R. stayed on the same level. Slovenian industry had after EU enlargement increased the specialization level. European internal market has forced the specialization of industries in Slovenia that can achieve a high competitiveness. On the other side can be seen the decrease of textile and leather industries in Slovenia. Structure of manufacturing has changed in last ten years. From the table can be seen the structure of manufacturing by Stehrer, Landsmann (1999) classification. Middle/High technological group, Low technological group and Group intensive on resources. Industrial structure has in the period 1993-1998 really changed by Hungary. High/middle technological group has in the year 1998 achieved 40% that is higher compared to Austria (31,4%), Czech R. (29,6%), Slovakia (29%), Slovenia (24,4%), Poland (23%), and Romania (17,2%). Slovenian industrial structure has not changed so strongly in the observed period. The changing of industrial structure in CEE countries is in interaction with modernization process and with FDIs. Technological modernization of industries is really important from the view of competitiveness, while industries achieve 73% Hungarian, 79% Slovenian, 76% Czech, 80% Slovakian and 70% Poland export. The increase of industrial production is by CEE countries in interaction with inflow of FDIs that brings new technology, modern management methods and new markets. European Union has after fall of the Berlin's wall achieved a cheap industrial base with low salaries. Slovenia is by car industry less interesting than Hungary, Czech R., and Slovakia. FDIs play an important role in restructuring and competitiveness. In bringing resources such as additional capital, technology and managerial know-how, as well as access to markets, FDI helps to raise productivity and expand exports. In countries

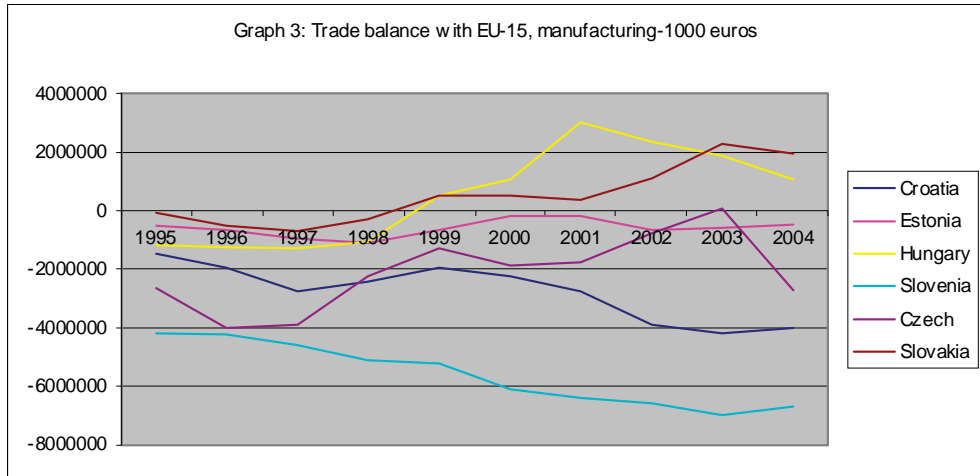
without a strong national innovation system and exports coming mainly from national enterprises, the question is how to cope with the pace of technical change and make inroads into markets held by more advanced countries. When the evolution of dynamic comparative advantage is supported by FDI there is a problem of sustainability and upgrading, especially as wages rise and cheaper competitors appear. The success of the state on international markets show the competitiveness of domestic industry. International openness to economic activities increases the success of countries. Internationalization supports international cooperation. From the view of increasing economic collaboration among countries from the view of involvement in international trade, international production and capital financial flows. Svetličič says that internationalization is not a one way road but two ways process. Classical view on competitiveness is ability of enterprises in industry or in state for achieving a well position on international markets in comparison with other states. Increase of export on more advanced markets EU mean also the increase of global competitiveness. Analysis of market shares and movements can be measured by analysing the export increase (i) on selected markets, that can be shown as  $\Delta X_i$

$$\Delta X_i = \sum_i x_{ij} (\Delta M / M) + \sum_i x_{ij} [(\Delta M_j / M_j) - (\Delta M / M)] + \sum_i x_{ij} [(\Delta x_{ij} / x_{ij}) - (\Delta M_j / M_j)]$$

where  $x_{ij}$  show an export of i-country by selected industry.  $M_j$  can be a whole EU import by selected industry. In our case is the whole import from the countries that are not a members of EU.  $M$  is a whole import of EU.  $\sum_i x_{ij} (\Delta M / M)$  can be shown as a whole demand, while  $\sum_i x_{ij} [(\Delta M_j / M_j) - (\Delta M / M)]$  interpret as component of structure change. The third component  $\sum_i x_{ij} [(\Delta x_{ij} / x_{ij}) - (\Delta M_j / M_j)]$  is a competitive effect.

The meaning of global competitiveness of the states is normally used in interaction with specific indicators of internationalization, especially with foreign trade balance. Normally the states that have increased the foreign trade balance have improved the global competitiveness. We can make a question in which way the increase of trade balance is a result of industrial competitiveness. If we have a lot of innovations, high quality of products and processes, then we have a positive effect on trade balance. Differences in trade balance can be seen in the time of stable competitiveness level. The favourable movement of foreign trade can be seen when prices of materials increase slower than prices of import products. When demand on the main export markets grow faster than on domestic, we can see a positive effect on trade balance.

Graph 3: Trade balance with EU-15, manufacturing, 000 Euro



Source: Eurostat, own calculation

Slovenia has a bad position by industrial competitiveness, compared to other CEE countries. The best position can be seen by Hungary and Slovakia. In observed period 1995-2004 has Slovakia achieved the best improvement of industrial competitiveness. Evaluation of industrial competitiveness is done by measuring export of new member countries into EU 15 in the period 2000-2004.

Table 2: Evaluation of industrial competitiveness of CEE countries (export in EU-15, period 2000-2004)

	ČZ	SK	H	SL	E	Positive countries	Number of pluses	Number of minuses
DA food products, beverages and tobacco	++	+++	++	+	++	5	10	
DB textiles and textile products	+	-	-	--	-	1	1	5
DC leather and leather products	-	+	--	-	-	1	1	5
DD wood and wood products	-	-	-	--	+	1	1	5
DE pulp, paper-paper products, publishing – printing	++	+	+	-	+	4	5	1
DF coke, refined petroleum products-nuclear fuel	-	+++	+		++	3	6	1
DG chemicals, chemical products and man made fibres	+		-	+	+++	3	5	1
DH rubber and plastic products	+	+++	+	+	+	5	7	
DI other non metallic mineral products	-	-	+	-	-	1	1	4
DJ basic metals and fabricated metal products	++	+	+	+	+	5	6	
DK machinery and equipment n.e.c.	++	++	+	+	+	5	7	



	ČZ	SK	H	SL	E	Pozitive countries	Number of pluses	Number of minuses
DL electrical and optical equipment	+++	+++	+		-	3	7	1
DM transport equipment	+	+++	+	+	++	5	8	
DN manufacturing n.e.c.	+	+		+	+	4	4	
Number of positive countries	10	10	9	7	10			
Number of pluses	16	21	10	7	15			
Number of minuses	4	3	5	7	4			

Source: Eurostat, own calculation

Own model of industrial competitiveness shows the next elements. Industrial competitiveness has improved in the period 2000-2004 by Slovakia and by Czech R. That economies have achieved a positive movement. Estonia and Hungary have market a small improvement, while the slovenian industry is on the same position. By slovenian industry can be seen a progress by (DA) production of food (DG) production of chemical products (DH) production of rubber products (DJ) production of metals (DK) production of machines (DM) production of cars (DN) and production of other manufacturing.

Table 3: Evaluation of industrial competitiveness of CEE countries  
(bilance with EU-15, period 2000-2004)

	ČZ	SK	H	SL	E	Pozitive countries	Number of pluses	Number of minuses
DA food products, beverages and tobacco	--	--	+	-	-	1	1	6
DB textiles and textile products	+	++	--	--	+	3	4	4
DC leather and leather products	--	++	--	--	--	1	2	8
DD wood and wood products	+	+	+	+	++	5	6	
DE pulp, paper-paper products, publishing – printing	--	++	--	--	-	1	2	7
DF coke, refined petroleum products-nuclear fuel	-	++	+	-	++	3	5	2
DG chemicals, chemical products and man made fibres	--	--	--	--	--			10
DH rubber and plastic products	--	-	--	--	--			9
DI other non metallic mineral products	+	+	--	--	--	2	2	6
DJ basic metals and fabricated metal products	--	+	--	--	--	1	1	8
DK machinery and equipment n.e.c.	-	--	--	--	--			9
DL electrical and optical equipment	-	-	++	--	--	1	2	6
DM transport equipment	+	+++	+	--	--	3	5	4
DN manufacturing n.e.c.	++	+	+	++	++	5	8	
Number of positive countries	5	8	6	1	4			
Number of pluses	6	14	7	1	7			
Number of minuses	15	8	16	23	18			

Source: Eurostat, own calculation

Own model of industrial competitiveness from the view of trade balance with EU-15 in the period 2000-2004 shows the next picture. Slovakia surplus by car industry have increased in the period 2000-2004 by ten time. Agriculture industry have a positive balance just by Hungary. Labour intensive industries as textile or leather industry have marked a strong increase in Slovakia. Slovenia has a bad position by trade balance. Positive balance can be seen just by wood industry and by other manufacturing. Industrial competitiveness in new member countries is in interaction with car industry. From the trade balance can be seen that Slovakia and Hungary have increased the position. Slovenia has a negative position on that field. The European internal market has increased the challenge among CEE industries for locational attractiveness. Specialization of industries is an important process for increasing industrial competitiveness.

## Conclusion

All hypothesis in the article stand. By herfindahl index has a Hungary the highest position in the whole period 1993-2005. Reasons for high concentration of FDI's in specific sectors had fostered the sectoral movement in transition period. Slovakian industry had in the period 1993-2005 increased the specialization process, while the Czech R. stayed on the same level. Slovenian industry had after EU enlargement increased the specialization level. European internal market has forced the specialization of industries in Slovenia that can achieve a high competitiveness. On the other side can be seen the decrease of textile and leather industries in Slovenia. Structure of manufacturing has changed in last ten years. Own model of industrial competitiveness shows the next elements. Industrial competitiveness has improved in the period 2000-2004 by Slovakia and by Czech R. That economies have achieved a positive movement. Estonia and Hungary have reached a small improvement, while the Slovenian industry is on the same position. By Slovenian industry can be seen a progress by (DA) production of food (DG) production of chemical products (DH) production of rubber products (DJ) production of metals (DK) production of machines (DM) production of cars (DN) and production of other manufacturing. Own model of industrial competitiveness from the view of trade balance with EU-15 in the period 2000-2004 shows the next picture. Slovakia surplus by car industry have increased in the period 2000-2004 by ten time. Agriculture industry have a positive balance just by Hungary. Labour intensive industries as textile or leather industry have marked a strong increase in Slovakia. Slovenia has a bad position by trade balance. Positive balance can be seen just by wood industry and by other manufacturing. Industrial competitiveness in new member countries is in interaction with car industry. From the trade balance can be seen that Slovakia and Hungary have increased the position. Slovenia has a negative position on that field. The competitiveness studies usually

focus on several different analytical levels: product, firm, industry cluster and nation. Information technologies call for more skills, higher levels of skill and different kinds of skill. Most successful economies are rising the skill content of their labour force. By reducing transportation and communication costs, it links economies and societies in closer, tighter webs. It facilitates the integration of production under common ownership (of transnational companies), allowing access to capital flows, world markets, skills and technology. Slovenian catch-up with the EU countries in terms of welfare and economic growth is associated with the application of new technology and knowledge imported from the more developed EU countries. The creation of a knowledge-based economy and society and the preparation of respective action plans presuppose that the situation of the Slovenian economy be analysed and deeper insights into the current basis of economic development gained. Only this basis can serve the planning of Slovenia's future in a way that would guarantee rapid economic development and harmonisation of the average wage level in Slovenia with that of the European union. The development of the knowledge society was declared to be one of the key goals of the European union at the Lisbon EU summit of 2000. This entails both economic and social objectives, according to which Europe seeks to become the most competitive and dynamic knowledge based economy in the world capable of sustainable economic growth with more and better jobs and greater social cohesion. For the last two hundred years, neo-classical economics has recognised only two factors of production: labour and capital. This is now changing. Information and knowledge are replacing capital and energy as the primary wealth-creating assets, just as the latter two replaced land and labor 200 years ago. In addition, technological developments in the 20th century have transformed the majority of wealth-creating work from physically-based to "knowledge-based." Technology and knowledge are now the key factors of production. With increased mobility of information and the global work force, knowledge and expertise can be transported instantaneously around the world, and any advantage gained by one company can be eliminated by competitive improvements overnight. The only comparative advantage a company will enjoy will be its process of innovation--combining market and technology know-how with the creative talents of knowledge workers to solve a constant stream of competitive problems--and its ability to derive value from information. We are now an information society in a knowledge economy. The ability to compete in free markets depends increasingly on the ability to incorporate new technologies into manufacturing and services, even in traditional activities; sustained growth, however, calls for a structural change from simple to more advanced technologies. The »bottom line« in the emerging paradigm is clearly competitiveness – the ability of an economy to grow in an open market with advantages that yield rising wages, sustained employment creation and improved working conditions. This requires greater technological, organisational and managerial capabilities on the part of firms – it is firms that compete. Competitiveness depends on many things. One

vital determinant – ultimately perhaps the most important determinant is the level and improvement of workforce skills at all levels. This paper starts with the changing nature of skill needs and describes the role of skills and capabilities from the view of international competitiveness. Traditional modes of competition, based on low costs and prices, are being replaced by competition driven by quality, reliability and networking. The ability to create and use economically viable new products depends mainly on the level of education. The socio-economic development of Slovenia and other candidate countries is in direct relation to their ability to raise the level of knowledge required in the competitive economy to the level of that of the countries with higher income, as well as on the ability to produce and implement strategically correct decisions.

Despite structural changes, the slovenian economy remains disproportionately dependent on traditional industries like textiles, clothing, metals and transport equipment. The relatively low share of labor and capital deployed in industries considered to be the 21 st-century vehicle of economic growth-computer and office equipment, communication equipment, semiconductors and biotechnology-hinders long-term development and weakens the long-term competitive prospects for the economy. Simultaneously, new private enterprises are not growing and the share of small enterprises in the new technology industries remains insignificant. Thus, Slovenia's industrial productivity lags far behind most advanced economies and, despite comparatively low wages, the export competitiveness of its manufacturers remains low. In 2000, gross value-added per Slovenian employee remained nearly three times lower than in comparable industries in EU countries. Companies, ultimately, set the level of national productivity, and their ability to upgrade is inextricably intertwined with the quality of the national business environment. More sophisticated strategies by companies require improved infrastructure, more advanced institutions, higher-skilled people, and better incentives. If there is to be rising prosperity, companies must transform their ways of competing. The types of competitive advantages a nation's companies enjoy must shift from comparative advantage-low-cost labour or natural resources-to competitive advantages due to unique products and processes. The transition in goals, operating practices, and strategies required for successful development are described in detail in last year's Report. What were strengths in the traditional way of competing become weaknesses at more advanced levels of development. Changes were often resisted as past approaches were profitable, and old habits are deeply ingrained in companies. Moving to more sophisticated ways of competing depends on parallel changes in the micro-economic business environment (Porter 2000) This can be understood in terms of 4 inter-related influences: factor (input) conditions; the context for firm strategy and rivalry; demand conditions; and related and supporting industries. Successful economic development is a process of successive upgradation in which the business environment in a nation evolves to support increasingly-sophisticated and productive ways of competing.

Nations at different levels of development face different challenges. The succession of improvements in the micro-economic environment that accompany successful development were explored in detail in last year's Report. Government plays an inevitable role in economic development because it affects many aspects of the business environment. Governments shape factor conditions; for example, through training and infrastructure policies. The sophistication of home demand is influenced by regulatory standards and processes, government purchasing, and openness to imports. Similar policy influences are present in all parts of the Diamond (the Five Forces Model of competitiveness). In addition to the government, many other institutions in an economy also play a role in economic development. Universities, schools, infrastructure-providers, standard-setting agencies, and myriad others contribute to the micro-economic business environment. Such institutions must not just develop and improve, but also become more connected to the economy, and better-linked with the private sector. Finally, the private sector itself is not only a consumer of the business environment, but can-and must-play a role in shaping it. Individual firms can take steps such as establishing schools, attracting suppliers, or defining standards that not only benefit themselves, but improve the overall environment for competing. Collective industry bodies, such as trade associations and chambers of commerce, also have important roles to play-in areas such as improving infrastructure and upgrading training institutions-that are not often recognised. Macro policies fostering high rates of capital investment will not translate into rising productivity unless the forms of investment are appropriate, the skills and supporting industries are present to make the investments efficient, and strong competitive pressures and corporate governance provide adequate market discipline. In Asia, for example, it was micro weaknesses in these areas that brought down economies that looked solid in terms of their macro-economic indicators. Similarly, the prudence of foreign debt-levels depends on what the capital is invested in, and the micro-economic fundamentals surrounding its deployment and governance. Regulating overall debt-levels is less important in many ways than improving the micro foundations. Other macro policies also depend on the supporting micro-economic conditions. High rates of public investment in human capital will not pay off unless a nation's micro-economic circumstances create the demand for skills in companies. Removing distortions in exchange rates, and other prices, will eliminate impediments to productivity, but the micro foundations must be in place if productivity is to increase. For sound policies at the macro level to translate into an increasingly productive economy, therefore, parallel micro-economic improvements must take place.

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